

AUFEIUS IMPRESSICOLLIS (HEMIPTERA: RHOPALIDAE):
EASTERNMOST U.S. RECORD, HOST PLANT
RELATIONSHIPS, AND LABORATORY REARING

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Abstract.—*Aufeius impressicollis* Stål (Hemiptera: Rhopalidae), a mainly southwestern U.S. and Mexican species recorded only as far east as Columbus, Ohio, is reported from Baltimore, Maryland, on smooth pigweed, *Amaranthus hybridus* L. (Amaranthaceae). *A. impressicollis* was reared on smooth pigweed in the laboratory; its habits are described, and developmental times of the immature stages are given. Ecological data from museum specimens and a review of the literature support the hypothesis that amaranths (and possibly members of the related family Chenopodiaceae) serve as host plants of this little studied rhopalid.

Aufeius impressicollis Stål, belonging to a monotypic genus, is a member of the rhopalid subfamily Rhopalinae and New World tribe Harmostini, which includes one other genus, *Harmostes* Burmeister (26 species) (Göllner-Scheiding, 1978). *A. impressicollis* is easily distinguished from *Harmostes* spp. by the laterally dilated abdomen and broadly exposed abdominal connexivum (Slater and Baranowski, 1978; Hoebeke and Wheeler, 1982). It is widely distributed in the western United States from Nebraska and South Dakota west to Idaho and Washington, and south to California, Utah, Arizona, New Mexico, and Texas (Torre-Bueno, 1941; U.S. National Museum collection); it ranges south through Mexico and into Guatemala (Brailovsky and Soria, 1981). This rhopalid of probable Sonoran origin (Slater, 1974) has not been collected frequently in the eastern part of its range. Arizona and Texas records predominate in the USNM holdings, with considerable material from Colorado and California. Froeschner (1942) noted it was uncommon in Missouri; a few specimens are known from Arkansas and Iowa (USNM).

The first record of *A. impressicollis* east of the Mississippi was that of Osborn and Drake (1915), who reported "large numbers" at Columbus, Ohio. Blatchley (1926) listed single specimens from Marion and Vigo counties, Indiana. No additional Ohio records of *A. impressicollis* are available from the Ohio State University collection, and Columbus remains the easternmost record.

On 14 July 1983 I collected 3 adults of *A. impressicollis* at Baltimore, Maryland, a record that extends the distribution eastward more than 350 miles (560 km). The specimens were swept from weeds in a vacant lot on Boston Street in an industrial area along the Northwest Branch of the Patapsco River. Seven adults were observed at the same site on 6 August 1983. Specimens have been deposited in the insect collections of the Pennsylvania Department of Agriculture (PDA), Cornell University (CUIC), and U.S. National Museum of Natural History (USNM).

It is possible that the Baltimore population is the result of a natural eastward dispersal, even though no records are available for Ohio since 1915 and no specimens have been recorded east of Columbus. Knowledge of heteropteran distributions in

North America is fragmentary, even for areas of the presumed well-collected eastern states, and reports of range extensions of hundreds of miles are not uncommon. However, it is equally likely that the population at Baltimore is adventive, the result of an introduction with commerce. Oil terminals, warehouses, and numerous railroad lines are present near the collection site of *A. impressicollis*. This area of the Port of Baltimore (Canton) is notable for the large number of exotic plant species that have been collected in ballast dumps along the port (Reed, 1964).

HOST PLANTS AND HABITS

Before returning to the original collection site, I reviewed the literature to determine the host plants most likely to be used by *Aufeius impressicollis* in Baltimore. It soon became apparent that little ecological information is available for this species. Schaefer and Chopra (1982) and Schaefer and Mitchell (1983) do not list *A. impressicollis* in their review of coreoid host plants. This rhopalid has been collected by sweeping bushes (Uhler, 1877), grasses (Osborn and Drake, 1915), borders of a timothy meadow (Blatchley, 1926), and weedy fields (Froeschner, 1942). Some of the specific plants mentioned in the literature may not represent true hosts: sugar beet, *Beta vulgaris* L. (Chenopodiaceae) (Knowlton, 1933); another chenopod, Russian thistle, *Salsola iberica* Sennen & Pau (Goeden and Ricker, 1968); and alfalfa, *Medicago sativa* L. (Fabaceae) (Benedict and Cothran, 1975). Label data from western specimens in the USNM collection provided three additional records from sugar beet, two from alfalfa, and one from celery [*Apium graveolens* L.—Apiaceae], "beans" [probably *Phaseolus vulgaris* L.—Fabaceae], and the chenopod *Salsola kali* L. (cited as *S. pestifer*). A specimen from Texas in the Texas A&M collection was taken on cotton [*Gossypium hirsutum* L.—Malvaceae]. Other labels on USNM specimens suggested a preference for plants of the Amaranthaceae. Specimens from California (Chico and Lindsay) had been collected on tumbleweed or tumble pigweed, *Amaranthus albus* L.; one specimen from Victoria, Texas was labeled "amaranthus"; and two from Garden City, Kansas had been taken on "pigweed" [probably *Amaranthus* sp.].

The vacant lot had been mowed when I returned to Baltimore on 6 August, and *Aufeius impressicollis* was not collected by sweeping the cutover weeds. Various unmowed plants growing along a brick wall and a building were then sampled individually by tapping vegetation over a small tray. Seven adults of the rhopalid were collected by tapping flower spikes of smooth pigweed, *Amaranthus hybridus* L. Three early-instar rhopalids that were observed but subsequently lost may have represented this species. No other plants, including *Chenopodium ambrosioides* L. of the related family Chenopodiaceae, yielded *A. impressicollis*.

Rhopalids, when collected by sweeping or when beaten onto a sheet or tray, initially may be sluggish but usually within seconds become active. Similar behavior was exhibited by the other Rhopalidae taken at the Baltimore site: *Harmostes reflexulus* (Say), *Liorhyssus hyalinus* (F.), and *Rhopalus (Brachycarenum) tigrinus*¹ (Schilling).

¹ Maryland is a new state record for this Old World rhopalid recently recorded in North America from New Jersey, New York (Long Island), and Pennsylvania (Hoebeke and Wheeler, 1982).

Table 1. Duration (in days) of the immature stages of *Aufeius impressicollis* reared in the laboratory at 22–26°C.

Stage	No. of observations	Range	Mean \pm SE	Cumulative mean age
Egg	22	8	8.0 \pm 0	8.0
Nymphal stages				
I	13	3–7	4.2 \pm 0.27	12.2
II	12	2–4	2.8 \pm 0.22	15.0
III	12	2–4	2.9 \pm 0.15	17.9
IV	11	3–10	4.5 \pm 0.58	22.4
V	7	5–8	6.3 \pm 0.36	28.7

However, adults of *A. impressicollis* usually feigned death after being knocked from pigweed onto a tray or when the contents of a sweep net were emptied.

In the laboratory under conditions of natural photoperiod (window light) and room temperature (22–26°C), adults were placed in small plastic boxes with a water source and excised flower spikes of smooth pigweed that included a few leaves. Mating and oviposition readily occurred, and the biological notes that follow are based on a limited number of observations on the resulting progeny. In a forthcoming paper on immature stages of eastern Rhopalidae by E. R. Hoebeke and A.G.W., the egg and fifth-instar nymph of *A. impressicollis* will be described and illustrated.

The pre-mating period for each of the two pairs observed was 4 days. Mating pairs assumed an end-to-end position that apparently is typical for the family (Paskewitz and McPherson, 1983) and often remained *in copula* for 4 hours or longer. One of the pairs mated 6 times; the other, 4 times. The preoviposition period was 2 days. Eggs were laid mainly on the flower spikes and on the sides and bottom of the rearing containers; a few were deposited on host foliage. One of the females laid 48 eggs over an 8-day period; the other, 34 eggs during 3 days. The incubation period was 8.0 days, and the total developmental period for the nymphal stages averaged 20.7 days (Table 1). Nymphs and adults fed only on floral structures, including seeds that had dropped onto leaves or to the bottom of the rearing containers.

The laboratory rearing of *Aufeius impressicollis* on *Amaranthus hybridus*, coupled with its collection on this plant at Baltimore and the records from amaranths in the western U.S., seems to establish members of the Amaranthaceae as host plants. In addition, I later discovered that Stegmaier (1950) collected 18 adults of *A. impressicollis* (and observed additional specimens) on redroot or rough pigweed, *Amaranthus retroflexus* L., in Kansas during June–August 1949. Collections from alfalfa, beans, celery, cotton, and other plants not closely related to the Amaranthaceae or Chenopodiaceae may reflect "sitting" records, or possibly were made from weedy amaranths growing in crop fields. Several *Amaranthus* spp., including *A. hybridus* and *A. retroflexus*, are common weeds of arable land (Muenscher, 1980). Studies on this rhopalid in western North America are needed to verify the apparent amaranth feeding trend and to determine whether chenopods serve as hosts.

Among the Coreoidea, several coreine genera are associated with plants of the

order Caryophyllales, including Amaranthaceae, but no North American rhopalid is known from this order (Schaefer and Chopra, 1982; Schaefer and Mitchell, 1983). Species of *Harmostes*, the only other genus in the Harmostini, feed mainly on composites (Schaefer and Chopra, 1982; Schaefer and Mitchell, 1983). *Aufeius* is closely related to *Harmostes* but differs in several morphological characters (Chopra, 1967; Schaefer and Chopra, 1982). It appears also that the two genera differ in their host plant preferences and in one aspect of their behavior.

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